IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant: John R. Harrison, et al.	§	Art Unit:	2193
Serial No.: 10/798,757	§	Examiner:	David H. Malzahn
Filed: March 11, 2004	§	Atty Docket:	ITL.1093US (P18487)
For: Computing Transcendental Functions Using Single Instruction Multiple Data (SIMD) Operations	§	Assignee:	Intel Corporation

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REPLY BRIEF

In response to the Examiner's Answer, the following Reply Brief is submitted.

The Answer asserts that "executing a single instruction multiple data floating point operation to obtain a first result for the function using the polynomial" preempts all implementations of a mathematical algorithm.

This assertion is untenable for two reasons. Firstly, it cannot possibly preempt all implementations since it only relates to executing a single instruction multiple data floating point operation. Other computerized operations can also be done using conventional instructions instead of SIMD instructions.

Secondly, there is no algorithm. The claim method calls for approximating a polynomial for a corresponding function. All that is being done is an approximation and, therefore, there is no mathematical algorithm. The cited *Gottschalk v. Benson* case is inapposite because it has to do with the situation where "a scientific truth, or the mathematical expression of it, is not a patentable invention ... ." See *Gottschalk v. Benson*, 93 S. Ct. 253, 277 (S. Ct. 1972).

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I hereby certify under 37 CFR 1.8(a) that this correspondence is being deposited with the United States Postal Service as **first class mail** with sufficient postage on the date indicated above and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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The argument that there is no practical application is contrary to the Manual of Patent Examining Procedure that indicates that a practical application of an abstract idea exists when the invention either transforms a physical object or, otherwise, produces a useful, concrete, and tangible result. A useful result has a practical use. Here, the use is clearly practical. A concrete use must be repeatable, which is clearly the case here. A tangible result requires that the claim must set forth a practical application. A practical application is a way of computing transcendental functions using single instruction multiple data operations. SIMD operations are a special type of computer operations. Through the steps described, transcendental functions can be computed using these types of instructions. This constitutes a tangible result.

Further, the claim cannot possibly preclude all use of any type of computation because: (1) there is no requirement for reducing an input argument X to a range to use the approximation; (2) approximating is not a mathematical algorithm; and (3) executing an SIMD operation is only one type of computer operation and, therefore, cannot possibly appropriate all practical uses of the alleged algorithm.

Thus, contrary to the *Gottschalk* case that expressly found that the only way to do the operation was with a digital computer, here, the claim does not even cover operation of any digital computer, but requires that it be executed by a single instruction multiple data floating point operation, a particular type of computer operation. Therefore, all practical applications of the alleged algorithm are not appropriated. Moreover, the alleged algorithm requires reduction and approximation, which is contrary to any suggestion that a law of nature or a mathematical algorithm are being appropriated.

Therefore, the rejection should be reversed.

Respectfully submitted,

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